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NEFSC Plankton Surveys, Second Longest in the North Atlantic, Add to New Global Effort

Global Alliance of Continuous Plankton Recorder Surveys Formed

When Chris Melrose began his career at NEFSC's Narragansett Laboratory, little did he realize where his work studying primary productivity and dissolved oxygen would lead. Now a member of the Center's Oceanography Branch, Melrose heads a long-term Ship of Opportunity Program (SOOP) that uses volunteer commercial cargo vessels as sampling platforms during their routine operations. Using an instrument, the Continuous Plankton Recorder (CPR), towed behind the ship, the SOOP program continues plankton surveys begun decades ago, but with a new global perspective and purpose.

In September 2011, Melrose represented NOAA and NEFSC at a meeting of the nine regional CPR surveys around the world to discuss the formation of a global program to routinely monitor changes in plankton patterns as an indication of the health of marine ecosystems.

The Global Alliance of Continuous Plankton Recorder Surveys, or GACS, was formed at that meeting in Plymouth, England: its primary goal to understand changes in plankton biodiversity at ocean basin scales through a global alliance of CPR surveys, like those done by NOAA and NEFSC.

"The idea is to work together to standardize our methods and contribute our data to a central repository or database that will make the data more accessible to potential users and more useful to the global scientific community," said Melrose. "Some of the participants already work together and share data, but having the global perspective will enable us to assess how changes and events at the local and regional level fit into the big picture, which is critical to understanding the impacts of climate change, ocean acidification and other phenomena that occur on a global scale."

GACS was formed during Plankton 2011, the celebration marking the 80th anniversary of the start of the North Sea CPR tows by Sir Alister Hardy, namesake of the instrument and the organization devoted to his vision, the Sir Alister Hardy Foundation for Ocean Science (SAHFOS). The GACS initiative was spearheaded by Peter Burkhill, the director of SAHFOS prior to his retirement in October of 2011. GACS is now chaired by Graham Hosie of the Australian Antarctic Division and includes member surveys from every continent except Antarctica.

Hardy, a fisheries biologist, designed the prototype CPR for use on a two-year expedition to Antarctica between 1925 and 1927 on the British research vessel *Discovery*. When he returned from that expedition, Hardy developed a smaller version for use on commercial ships. SAHFOS has been collecting data from the North Atlantic and North Sea since 1931, when the first tow of Hardy's mechanical Continuous Plankton Recorder (CPR) was made on a merchant vessel, the SS *Albatross*, traveling between Hull, England and Bremen, Germany. Since then the CPR survey has analyzed 250,000 samples, counted 500 taxa and towed some 5 million miles, making it "the longest, most geographically extensive biological survey in the world", according to GACS's first newsletter, issued in January 2012. At the end of April 2012 the CPR survey passed the 6 million nautical miles towed.

Local and regional monitoring and observational programs established in the past have not had a global perspective on plankton biodiversity in response to global events like climate change and ocean acidification. GACS will provide that perspective using CPR data, which will also allow researchers to assess changes and events at a local or regional level in a world-wide context. Having so much data from around the world in a standardized format in one place, available to those who collect it as well as to potential users, will be invaluable, especially as the CPR surveys are developed in other parts of the world.

The second GACS Workshop will be held September 19-20, 2012 in Paris at the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (UNESCO).

To learn more about the Global Alliance of Continuous Plankton Recorder Surveys, visit the GACS website at <http://www.globalcpr.org/>. To learn more about the instrument and how it works, the NEFSC's surveys and more, including a YouTube animation, click on the related links listed below.

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Related links:

The Global Alliance of Continuous Plankton Recorder Surveys (GACS): <http://www.globalcpr.org/>

Sir Alister Hardy Foundation for Ocean Sciences (SAHFOS): <http://www.sahfos.ac.uk/sahfos-home.aspx>

NEFSC's Oceanography Branch: <http://www.nefsc.noaa.gov/epd/ocean/>

NOAA Ship of Opportunity Program (SOOP): <http://www.aoml.noaa.gov/phod/soop/index.php>